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(71) Applicant (for all designated States except US): **AIR PRODUCTS AND CHEMICALS, INC. [US/US]; 7201 Hamilton Boulevard, Allentown, PA 18195-1501 (US)**

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DOWNIE, Neil, Alexander [GB/GB]; 1 Eustace Road, Guildford, Surrey GU4 7EB (GB). KERR, Stuart, Alexander [GB/GB]; 40 Meadow Drive, Knustford, Cheshire WA16 0DT (GB).**

(74) Agent: **BURFORD, Anthony, F.; W.H. Beck, Greener & Co., 7 Stone Buildings, Lincoln's Inn, London WC2A 3SZ (GB).**

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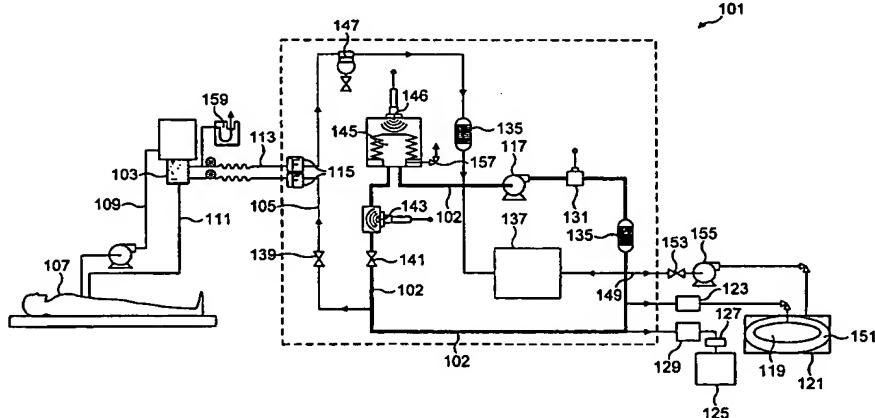
## Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report: 18 March 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

## (54) Title: MEDICAL GAS RECIRCULATION SYSTEM



WO 2003/092776 A3

(57) Abstract: A medical device (103) is supplied (105) with a gas mixture from a higher pressure section of a main circuit (102) in which medical gas recirculates through the higher pressure section and a lower pressure section. Decontaminated spent gas is returned to the lower pressure section of the main circuit. Pressure in the higher pressure section is maintained by a pressure maintaining valve (141) and gas flow in the main circuit is maintained by a volume regulator (145) in the lower pressure section. The composition of the recirculating gas mixture is maintained by addition of respective feed gases in response to concentration and/or volume variation measurement. The method has particular application to the feed of a binary oxygen/xenon mixture to a cardiopulmonary bypass oxygenator or an artificial ventilator.

## INTERNATIONAL SEARCH REPORT

PCT/GB 03/01875

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A61M16/00 A61M16/10 A61M16/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 131 571 A (GRAVENSTEIN JOACHIM S ET AL) 17 October 2000 (2000-10-17) column 3, line 66 - column 4, line 32 column 5, line 17 - line 35 column 7, line 43 - column 9, line 7 column 9, line 57 - line 59 column 12, line 34 - line 63 column 13, line 25 - column 14, line 22 column 15, line 37 - column 17, line 53 column 20, line 51 - column 21, line 63 figures 1,2,5,6 -----	1-7,9
Y	EP 0 861 672 A (PANINA ELENA VLADIMIROVNA) 2 September 1998 (1998-09-02) column 3, line 43 - column 4, line 33 column 5, line 20 - line 45 figureclaims 6,12,13 -----	1,3-7
		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

1 September 2003

Date of mailing of the international search report

16. 01. 04

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentdaan 2  
NL - 2280 HV Rijswijk  
Tel: (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Borowski, A

## INTERNATIONAL SEARCH REPORT

PCT/GB 03/01875

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 745 405 A (SIEMENS ELEMA AB) 4 December 1996 (1996-12-04) column 3, line 5 - line 10 column 5, line 19 - line 34 claim 1; figures 1,2 -----	2
Y	SU 1 188 638 A (DYACHENKO MIKHAIL A) 30 October 1985 (1985-10-30) column 1, line 1 - line 5 -----	9
A	US 4 903 693 A (YASUE NAOTO) 27 February 1990 (1990-02-27) column 1, line 10 - line 15 column 1, line 46 - column 2, line 18 column 2, line 65 - column 3, line 46 column 4, line 25 - line 53 column 10, line 12 - column 11, line 13 claims 1-4,6,7; figures 1,2 -----	1

# INTERNATIONAL SEARCH REPORT

PCT/GB 03/01875

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: **16-24**  
because they relate to subject matter not required to be searched by this Authority, namely:  
**Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy**
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

**see additional sheet**

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**1-11**

**Remark on Protest**

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

Continuation of Box I.1

Claims Nos.: 16-24

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

Claims 1-11 define an apparatus for providing and circulating to a medical device a medical gas mixture,  
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2. claims: 12-15

Claims 12-15 define a medical device system comprising a medical device connected to a medical device supply circuit.  
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## INTERNATIONAL SEARCH REPORT

PCT/GB 03/01875

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
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